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ABSTRACT

This booklet contains information on minimum standards for associate degree programs in technical education. It covers the following topics in 13 short sections: American Technical Education Association objectives; definition of technical education; recommended minimum professional standards for hiring technical instruction personnel; description of occupational education; technical-occupational two-year minimum standards for the associate degree on a 60-credit hour basis (illustrative chart); technical-occupational two-year associate degree subject matter emphasis by semester (chart); educational ranges (chart); activities performed by technicians; special abilities required of technicians; typical educational levels and job attributes of the research-design-production team (chart); standards of education for awarding the associate degree in programs of technical-occupational education; summary of minimum standards; and descriptions of associate degrees and certificates. (KC)

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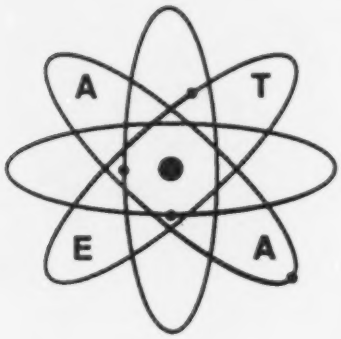

NATIONAL MINIMUM STANDARDS FOR ASSOCIATE DEGREE TECHNICAL EDUCATION PROGRAMS

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National Minimum Standards for Associate Degree Technical Education Programs

Accreditation standards supercede these minimum standards.

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American Technical Education Association Objectives

1. To promote technical education for interested and qualified youth and adults.
2. To promote technical education and training in order to support the needs of business and industry making them more productive and competitive in the world marketplace.
3. To provide professional development opportunities for teachers, administrators and support personnel in postsecondary technical education.
4. To establish and promote standards for technical education.
5. To provide an opportunity for the exchange of ideas among persons in technical education, business and industry.
6. To involve local, state and national legislators in ATEA activities.

Definition of Technical Education

Technical education is a planned sequence of classroom and laboratory experiences, usually at the postsecondary collegiate level, two years in length, designed to prepare men and women for a wide range of job opportunities in well-identified fields of technology. The program of instruction normally includes studies in mathematics, the sciences inherent in a technology, selected skills, materials, processes and systems commonly used in the technology. Technical education programs provide intensive training in a field of specialization, and include communication skills, computer literacy, as well as general education studies. Instruction in technical programs emphasizes principles involved in analyzing and solving problems and design within the technology rather than specific techniques or skills.

The technical curriculum should prepare the graduate to:

- Obtain a job within the technology,
- Become a productive employee with a minimum of additional training,
- Advance with developments in the technology, and
- Continue his or her education through readings, evening classes and other education programs.

Technical education prepares individuals to work in an area between the operator, or special skills jobs, and the established profession such as medicine, engineering and science.

Recommended Minimum Professional Standards for Hiring Technical Instruction Personnel

I. General Requirement - Technical Specialty Instructor

Bachelor's degree with an area of specialization in subject matter in which he/she will be teaching; and/or significant relevant experience in the technical field that includes technical content of a higher level than that in which he/she proposes to teach. Instructors should have a master's degree or pursue the degree within a reasonable length of time.

II. General Requirement - Related Technical Instructor

Bachelor's degree in the particular field, or closely-associated field, in which he/she will teach, and evidence an interest in professional technical education.

III. Professional Education Requirement - Technical Specialty and Related Technical Instructors

(A) A minimum of six (6) semester hours of professional technical education courses are recommended and should be completed either before employment or within two (2) years after employment.

(B) The content of these courses should include those concepts which are pertinent to the development of quality technical programs.

IV. General Requirement - Business and Industry Technical Experience

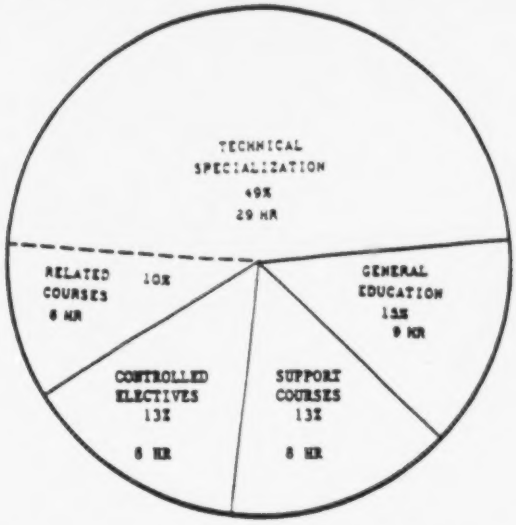
Adequate experience related to the technical specialty to be determined by the institution. Two (2) to five (5) years current, relevant experience should be adequate, depending on the type of experience. Recent certification or competency testing, where available, in the field of technical expertise, is desired.

Occupational Education

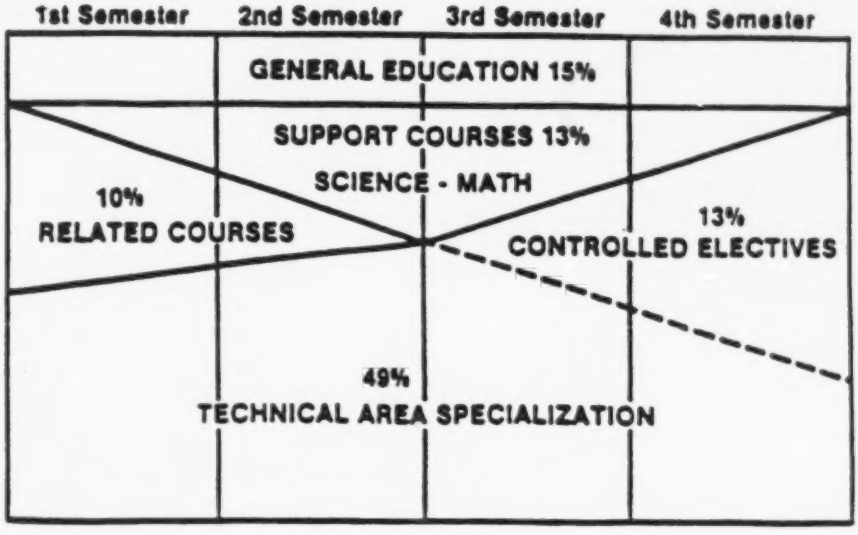
The following charts and graphs are attempts to differentiate between varying kinds of educational programs and institutional types. In most states, area vo-tech centers are primarily concerned with the occupational education of the high school student and secondarily with the adult.

Post-high school occupational education, on the other hand, is the mission of the technical institutes, junior and community colleges, and some universities. This education is usually technical in nature, college-based, and requires a more mature person to complete an associate degree program during a two-year period.

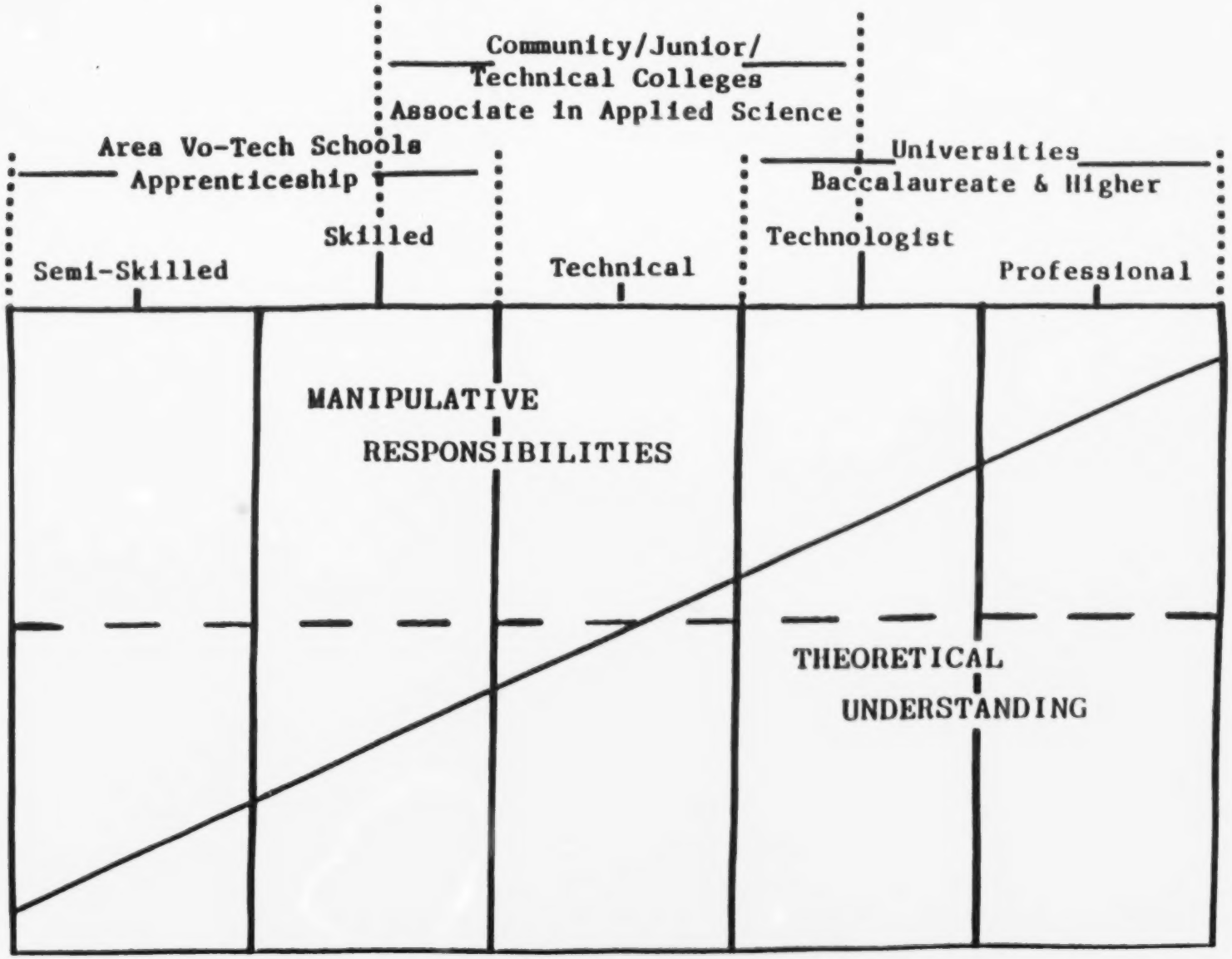
Technical-Occupational Two-Year Minimum Standards For the Associate Degree on a 60 Credit Hour Basis



Technical-Occupational Two-Year Associate Degree Subject Matter Emphasis By Semester



EDUCATIONAL RANGES



The relationship of the Manipulative Responsibilities and Theoretical Understanding characteristics in occupational responsibilities for job levels is identified in the above chart.

Activities Performed By Technician

A technician must perform a variety of functions. He/she must be prepared to do the following:

1. Apply knowledge of science and mathematics extensively in rendering direct technical assistance.
2. Design, develop or plan modifications of new products, procedures, techniques, processes or applications.
3. Help plan, supervise or inspect.
4. Help plan work as a member of the management unit responsible for efficient use of human resources, materials, money and equipment.
5. Advise, plan and estimate costs of operations as a field representative.
6. Assume responsibility for supervision or inspection of projects, and prepare technical reports covering supervision or inspection.
7. Prepare or interpret engineering drawings and sketches, or write detailed specifications or procedures.
8. Select, compile and use technical information from references such as engineering standards, handbooks, specifications, and technical digests of publication.
9. Analyze and interpret information obtained from inspections, and make evaluations upon which technical decisions are based.
10. Analyze and diagnose technical problems that involve independent decisions. Judgement must be based not only on technical know-how, but on substantive experience in the occupation field as well.
11. Deal with a variety of technical problems which must be solved by a person with an understanding of several technical fields. Such versatility depends on broad experience in applying scientific and technical principles, the antithesis of narrow speculation.

Special Abilities Required Of Technicians

Technicians must have the following special abilities:

1. Proficiency in the use of the disciplined and objective scientific method in practical application of the basic principles and laws of physics and chemistry and/or the biological sciences as they constitute the scientific base for the individual's field of technology.
2. Facility with mathematics: Ability to use algebra and trigonometry as tools to develop, to define, or to quantify scientific phenomena or principles; and, when needed, an understanding of, though not necessarily facility with, higher mathematics through analytical geometry, calculus and differential equations, according to the requirements of the technology.
3. A thorough understanding of, and facility in, the use of the materials, processes, apparatus, procedures, equipment, methods and techniques commonly used in the technology.
4. An extensive knowledge of a field of specialization with an understanding of the application of the underlying physical or biological sciences as they relate to engineering, architectural and building construction, or research activities that distinguish the technology of the field. The degree of competency and the depth of understanding should be sufficient to enable the technician to establish effective rapport with the architects, engineers or management persons with whom he/she works; and to enable him/her to perform a variety of detailed scientific or technical work as outlined by general procedures or instructions but requiring individual judgement, initiative and resourcefulness in the use of techniques, handbook information and recorded scientific data.
5. Communication skills that include the ability to record, analyze, interpret and transmit facts and ideas with complete objectivity orally, graphically and in writing.

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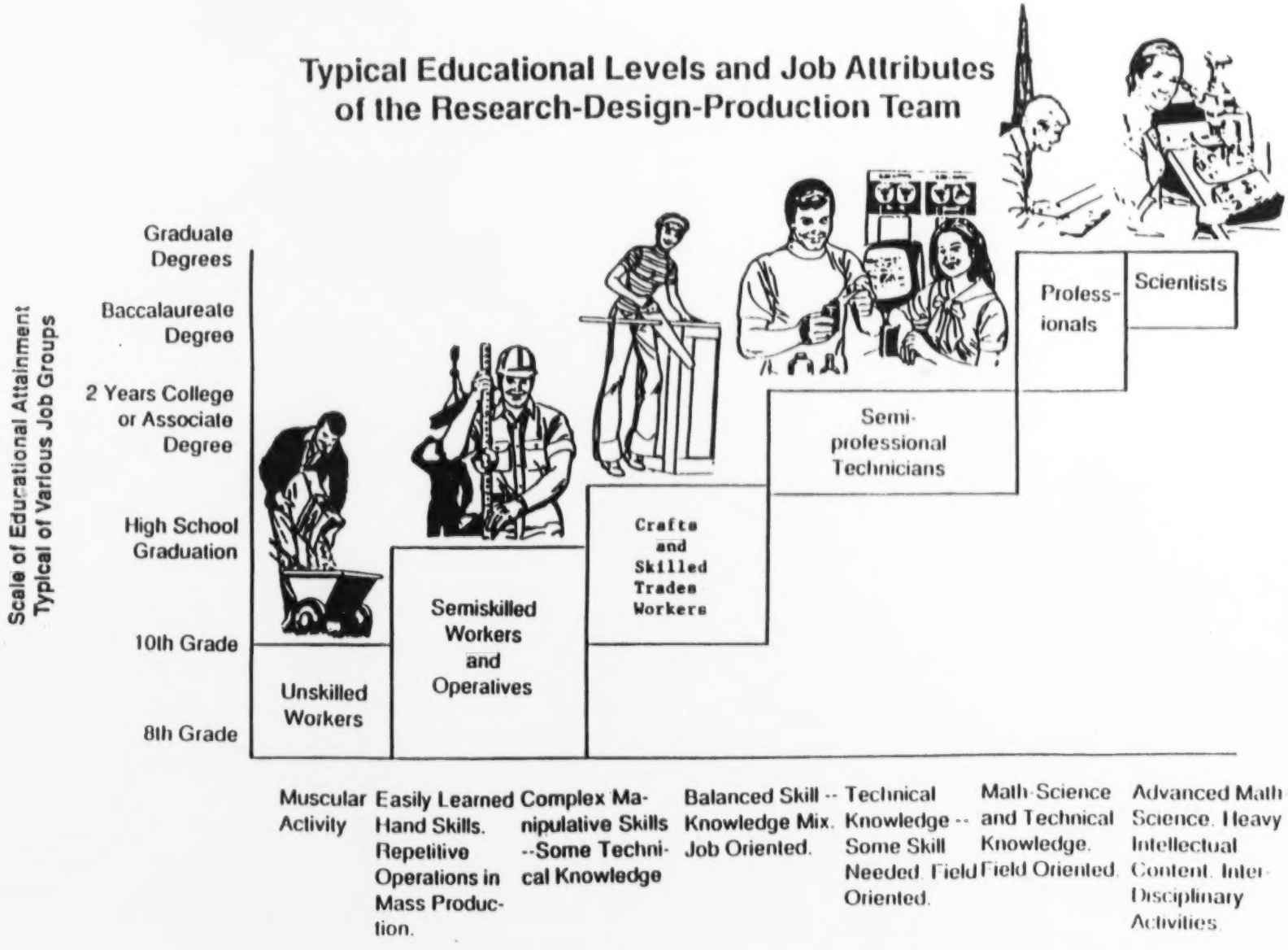
Typical Educational Levels and Job Attributes of the Research-Design-Production Team


Scale of Educational Attainment
Typical of Various Job Groups
Graduate Degrees
Baccalaureate Degree
2 Years College or Associate Degree
High School Graduation
10th Grade
8th Grade
Unskilled Workers
Semiskilled Workers and Operatives
Crafts and Skilled Trades Workers
Semi-professional Technicians
Profess-ionals
Scientists
Muscular Activity
Easily Learned Hand Skills. Repetitive Operations in Mass Production.
Complex Manipulative Skills --Some Technical Knowledge
Balanced Skill -- Knowledge Mix. Job Oriented.
Technical Knowledge -- Some Skill Needed. Field Oriented.
Math-Science and Technical Knowledge. Field Oriented.
Advanced Math Science. Heavy Intellectual Content. Inter-Disciplinary Activities.
Scale of Job Complexity and Sophistication

Standards of Education for Awarding The Associate Degree in Programs of Technical-Occupational Education

The minimum standards for the awarding of associate degree in technical-occupational areas of specialization at institutions shall be as follows:

1. The completion of 60 semester credit hours, exclusive of basic required physical education or military science courses, with an overall grade-point average of 2.0.
2. The completion, as a portion of the overall 60 semester credit hours, of a basic general education core of a minimum of 17 semester credit hours which shall include the following:

   (a) Communications ..... 3 hours

   This must include either (i) a college-level communications course in technical communications designed around the technical-occupational specialty, or (ii) a course in English grammar or composition. Evidence of writing competency is required.

   (b) Social Studies ..... 6 hours

   This must include one college-level American History course and one American Government course.

   (c) Selected Elective ..... 8 hours

   Selected, approved or free electives may be chosen from the following areas: science, mathematics, human relations, management, behavioral science, economics and communications. Computer-science or computer-technology courses are required for all students.
3. The completion, as a portion of the overall 60 semester credit hours, of 29 semester credit hours of technical-occupational specialty courses. Evidence of subject matter competency is required.
4. The completion, as a portion of the overall 60 semester credit hours, of 8 hours of technical-occupational support courses. These courses are those that are not a part of the technical-occupational specialty, but which support the specialty, i.e., math or science.
5. The completion, as a portion of the overall 60 semester credit hours, of 6 hours of technical-occupational related course work. These courses are those that are considered part of the specialty job cluster, i.e., engineering drawing.
6. A structured work experience program in the technical specialty is highly desirable, i.e., coop, internship, etc.
7. To ensure that technical competencies taught are state-of-the-art, the use of business, health and industrial advisory committees are required.

Summary of Minimum Standards

General Education	17 hours
Technical-Occupational Specialty	29 hours
Technical-Occupational Support Courses	8 hours
Technical-Occupational Related Courses	6 hours
Total Minimum Semester Credit hours	60 hours

Associate Degrees and Certificates

1. The title, "Associate in Applied Science" is awarded upon completion of a program designed to lead the individual directly to employment in a specific career. Although the objective of this degree is to enhance employment opportunities, some bachelors' degree institutions have developed upper-division programs to recognize this degree for transfer purposes, and this trend is to be encouraged when appropriate. The title, "Associate in Applied Science" may be without designation or may be used with a designation to denote special fields of study such as nursing, computer science, and the like.
2. "Associate in Technology" or the "Associate in _____ Technology" are conferred on students successfully completing degree requirements in programs of technical-occupational education. The word "Technology" may be preceded by any one of the following qualifying adjectives: Agricultural, Business, Health, Home Economics, Engineering, Human Services or Industrial.
3. Technical-occupational programs not leading to a degree may be of any length, ranging from one semester to six or more semesters in duration. Criteria and standards for evaluating certificate and diploma programs are therefore predicated upon the length of a particular program, and the requirements in the job market for the type of worker being trained. Generally speaking, certificate and diploma programs may be evaluated in the same manner as degree programs of the same or similar length. Thus a program of one semester in length would require a minimum of fifteen semester hours for completion, divided among specialized and related courses, whereas a two-year certificate program would require sixty semester hours, divided among general education, specialized education and related courses.